

Practice: 351 - Water Well Decommissioning**Scenario: #1 - Shallow Well less than 20 feet deep****Scenario Description:**

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Shallow or hand dug well that is less than 20 feet deep and inactive, abandoned, or unusable and provides a potential conduit for pesticides or nutrients to enter an aquifer. Assume 30 inch diameter casing.

After Situation:

Well is permanently sealed to prevent potential contamination of aquifer. Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Linear Feet

Scenario Typical Size: 15

Scenario Cost: \$2,320.64

Scenario Cost/Unit: \$154.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$4.70	2.7	\$12.69
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$172.10	1	\$172.10
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.27	2	\$28.54
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	2	\$48.98
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$588.92	2.7	\$1,590.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$232.71	2	\$465.42

Practice: 351 - Water Well Decommissioning**Scenario: #2 - Shallow Well greater than 20 feet deep****Scenario Description:**

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Shallow or hand dug well that is greater than 20 feet deep and inactive, abandoned, or unusable and provides a potential conduit for pesticides or nutrients to enter an aquifer. Assume 30 inch diameter casing.

After Situation:

Well is permanently sealed to prevent potential contamination of aquifer. Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Linear Feet

Scenario Typical Size: 30

Scenario Cost: \$4,432.13

Scenario Cost/Unit: \$147.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$4.70	5.5	\$25.85
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$172.10	3	\$516.30
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.27	3	\$42.81
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$22.13	3	\$66.39
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	3	\$73.47
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$588.92	5.5	\$3,239.06
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$232.71	2	\$465.42

Practice: 351 - Water Well Decommissioning**Scenario: #3 - Drilled well less than 300 feet deep with casing removed****Scenario Description:**

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Drilled well that is less than 300 feet deep and inactive, abandoned, or unusable and provides a potential conduit for pesticides or nutrients to enter an aquifer. Typical well has 6 inch diameter casing.

After Situation:

Well is permanently sealed to prevent potential contamination of aquifer. Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Linear Feet

Scenario Typical Size: 200

Scenario Cost: \$7,660.49

Scenario Cost/Unit: \$38.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$172.10	8	\$1,376.80
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.27	8	\$114.16
Hydrofracture Rig with Operator	1818	Equipment and power unit costs including mechanical packer equipment. Labor included.	Hour	\$416.13	8	\$3,329.04
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$22.13	8	\$177.04
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$588.92	1.5	\$883.38
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$444.31	4	\$1,777.24

Practice: 351 - Water Well Decommissioning**Scenario: #4 - Drilled well greater than 300 feet deep****Scenario Description:**

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Drilled well that is greater than 300 feet deep and inactive, abandoned, or unusable and provides a potential conduit for pesticides or nutrients to enter an aquifer. Typical well has 6 inch diameter casing.

After Situation:

Well is permanently sealed to prevent potential contamination of aquifer. Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Linear Feet

Scenario Typical Size: 500

Scenario Cost: \$11,460.29

Scenario Cost/Unit: \$22.92

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.27	12	\$171.24
Hydrofracture Rig with Operator	1818	Equipment and power unit costs including mechanical packer equipment. Labor included.	Hour	\$416.13	12	\$4,993.56
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$172.10	12	\$2,065.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$22.13	12	\$265.56
Materials						
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	3	\$8.49
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$588.92	3.7	\$2,179.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$444.31	4	\$1,777.24

Practice: 351 - Water Well Decommissioning**Scenario: #5 - Decommissioning a drilled well less than 300 feet deep without casing removal****Scenario Description:**

A well permit holder will seal and permanently close an inactive, abandoned, or unusable irrigation well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations. Does not require removal of entire casing depth.

Before Situation:

Drilled irrigation well that is less than 300 feet deep and inactive, abandoned, or unusable and provides a potential conduit for pesticides or nutrients to enter an aquifer. Typical well has 6 inch diameter casing.

After Situation:

Irrigation well is permanently sealed to prevent potential contamination of aquifer. Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Linear Feet

Scenario Typical Size: 200

Scenario Cost: \$1,227.21

Scenario Cost/Unit: \$6.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$50.55	1	\$50.55
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.27	1	\$14.27
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	1	\$24.49
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$18.98	1	\$18.98
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$588.92	1.5	\$883.38
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$232.71	1	\$232.71